

AMENDMENTS TO THE CLAIMS

Prior to examination of the present application, please add Claims 2-20 as follows.

1. (Currently Amended) A memory device comprising:

a plurality of cells arranged into an array, where the array includes a plurality of word lines and a plurality of bit lines, where a cell in the plurality of cells further ~~comprises~~ : comprises:

an antiferromagnetic layer disposed adjacent to a soft layer of ferromagnetic material, where the antiferromagnetic layer is also disposed on a side of the soft layer that is opposite to a hard layer of ferromagnetic material; and

a spacer layer of non-ferromagnetic material disposed between the hard layer and the soft layer.

2. (New) The memory device as defined in Claim 1, wherein the antiferromagnetic layer comprises at least one alloy of manganese.

3. (New) The memory device as defined in Claim 1, wherein the antiferromagnetic layer comprises ferro manganese (FeMn).

4. (New) The memory device as defined in Claim 1, wherein a thickness of the antiferromagnetic layer is within a range of about 10 Angstroms (Å) to about 70 Å.

5. (New) The memory device as defined in Claim 1, wherein the soft layer is in direct contact with the antiferromagnetic layer, where the spacer layer is in direct contact with the soft layer, and where the hard layer is in direct contact with the spacer layer.

6. (New) A computer comprising:

a magnetic random access memory (MRAM) configured to store data in antiferromagnetically stabilized pseudo spin valves (ASPSVs) configuration, where an ASPSV comprises:

an antiferromagnetic layer;

a soft layer of ferromagnetic material disposed adjacent to the antiferromagnetic layer;

a spacer layer of non-ferromagnetic material disposed adjacent the soft layer; and

a hard layer of ferromagnetic material disposed adjacent the spacer layer such that the spacer layer is disposed between the hard layer and the soft layer.

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7. (New) The computer as defined in Claim 6, wherein the antiferromagnetic layer comprises at least one alloy of manganese.

8. (New) The computer as defined in Claim 6, wherein the antiferromagnetic layer comprises ferro manganese (FeMn).

9. (New) The computer as defined in Claim 6, wherein a thickness of the antiferromagnetic layer is within a range of about 10 Angstroms (Å) to about 70 Å.

10. (New) The computer as defined in Claim 6, wherein the ferromagnetic material used in the hard layer and in the soft layer is the same, and where a thickness of the soft layer is between about 20% to about 80% of the thickness of the hard layer.

11. (New) The computer as defined in Claim 6, wherein the soft layer is in direct contact with the antiferromagnetic layer, where the spacer layer is in direct contact with the soft layer, and where the hard layer is in direct contact with the spacer layer.

12. (New) A digital system comprising:

a magnetic random access memory (MRAM) configured to store data in antiferromagnetically stabilized pseudo spin valves (ASPSVs), where an ASPSV further comprises:

a hard layer of ferromagnetic material, where the hard layer is adapted to store data in a magnetic orientation;

a spacer layer of non-ferromagnetic material disposed adjacent the hard layer;

a soft layer of ferromagnetic material disposed adjacent the spacer layer such that the spacer layer is between the hard layer and the soft layer, where the soft layer is adapted to switch magnetic orientation to allow data to be read from the hard layer;

an antiferromagnetic layer disposed on a side of the soft layer that is opposite to the spacer layer; and

an AFM interlayer disposed between the soft layer and the antiferromagnetic layer, where the AFM interlayer is not formed from an antiferromagnetic material.

13. (New) The digital system as defined in Claim 12, wherein the AFM interlayer is about 1 Å to about 5 Å in thickness.

14. (New) The digital system as defined in Claim 12, wherein the AFM interlayer is about a monolayer in thickness.

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15. (New) The digital system as defined in Claim 12, wherein the AFM interlayer is less than a monolayer in thickness.

16. (New) The digital system as defined in Claim 12, wherein the antiferromagnetic layer comprises an alloy of manganese.

17. (New) The digital system as defined in Claim 12, wherein the antiferromagnetic layer comprises at least one of nickel oxide (NiO) and nickel cobalt oxide (NiCoO).

18. (New) The digital system as defined in Claim 12, wherein the AFM interlayer comprises iridium (Ir).

19. (New) The digital system as defined in Claim 12, wherein the AFM interlayer comprises at least one of copper (Cu), ruthenium (Ru), chromium (Cr), and aluminum (Al).

20. (New) The digital system as defined in Claim 12, wherein the spacer layer is in direct contact with the hard layer, where the soft layer is in direct contact with the spacer layer, where the AFM interlayer is in direct contact with the soft layer, and where the antiferromagnetic layer is in direct contact with the AFM interlayer.